

## ABSTRACT

A toughened nylon that comprises a matrix nylon and a long-chain nylon is described. The matrix nylon is prepared by the homopolymerization or 5 copolymerization of cyclic lactams monomers and their corresponding amino acids. The structure of said cyclic lactams is represented by Formula (I) and the structure of amino acids is represented by (I'). In Formula (I) and (I') A is H or alkyl with 1-8 carbon and  $3 \leq n \leq 11$ . The long-chain nylon is selected from nylons that contain repeating units having structures represented by Formula (II), (III) or (IV). 10 In Formula (II) D is  $-(CH_2)_x-$ , in which H may be substituted with  $C_{1-4}$  alkyl optionally; E is  $-(CH_2)_y-$  or phenylene, in which H may be substituted with  $C_{1-4}$  alkyl optionally;  $4 \leq x \leq 34$  and  $4 \leq y \leq 34$ . In Formula (IV)  $5 \leq u \leq 34$ ,  $5 \leq v \leq 34$ , and  $u \neq v$ . The proportion of said long-chain nylon in the total weight of toughened 15 nylon is 2-45 %. As the toughened nylon has very good interface combination, only one melting peak is detected with differential scanning calorimetry. Besides the preparation process and application of the toughened nylon are described hereafter 20 too.

